

A REVIEW PAPER ON MINI TRACTOR (POWER TILLER) ATTACHMENTS

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Abstract - This farming machine is completed quite one operation one by one therefore it's called as multipurpose agricultural mini tractor. This machine done five sort of operation by small changes or assembly and disassembling of some tools. Five operations are cultivation, seed sowing, row making, leveler, and hopper. The AIM of "Fabrication of multipurpose agricultural Mini Tractor" is provide farmer with multipurpose equipment which implements all the scientific farming specifications and technology to urge maximum yield and good quality crops reducing investment and member of labor. The machine is successfully tested into farming field and reduces time 62.5% for ploughing and 66% for seed sowing as compare to the normal method. Less manpower needed to work this machine i.e. 1 person to work. Therefore, the value of production crops is a smaller amount. Design and fabricate machine at affordable price for little farmer. This machine is more beneficial to farmer who cannot afford farming equipment at higher cost. And one person are often easily handle this machine. The device is formed such are often easily operated in field. The vehicle power is provided by four stroke petrol engines, and controls are given at handles and foot rest

Key Words: Multipurpose, Fabrication, Cultivation, Ploughing, Row making etc.

1. INTRODUCTION

Agriculture has been foundation of the Indian economy and 70% of people depends on the outcome of farming. The history of Agriculture in India dates back to Indus Valley Civilization Era and even before that in some parts of Southern India. Today, India ranks second worldwide in farm output. Farmers are poor due to which they are unable to purchase tractors and other costly equipment's hence they use traditional method of farming. Mainly, many farmers in India also use bullocks, horses for farming operation. This will not satisfy need of energy requirement of the farming as compared to other countries within the world. So, we are thinking that human and animal efforts can be replace by some advance mechanization which will be suitable for small scale farmer from economical and Effort point of view. In today's world everything is getting modernized. Agriculture fields are slowly destroying & these land are used for some other purpose this is because the

income from agriculture is less, although the work involved is high. Mechanization was one among the massive factors liable for urbanization and industrial economies. Modern agricultural techniques and equipment's aren't employed by small land holders because these equipment's are too expensive and difficult to accumulate. By adopting scientific farming methods, we will get maximum yield and good quality crops which may save a farmer from going bankrupt but majority of farmers still uses primitive method of farming techniques thanks to lack of data or lack of investment for utilizing modern equipment. The special vehicle field are successively increasing its productivity in agriculture field. Some of the main problems within the Indian agricultural are rising of input costs, availability of skilled labours, lack of water resources and crop monitoring. To overcome such adversity, the automation technologies were utilized in agriculture. The automation within the agriculture could help farmers to reduce their efforts. The vehicles are being developed for the processes for cultivating, seed sowing, levelling, hopper, row making. All of these functions haven't yet performed employing one vehicle. In this equipment we used 135cc engine, 8500rpm and next five operation are manual base which is cultivation, row maker, leveller, hopper, seed sower. This machine performs five farming operation;

1. Cultivator
2. Row Maker
3. Land Leveller
4. Hopper Tool
5. Seed Sower



Fig. 1 – Mini Tractor

2. OPERATIONS

The operation of a mini tractor involves sitting on the driver seat and operate handle with the help of stiring. Staring is attach in on wheel which smoothly turn the mini tractor. During peak seasons of seedbed preparation, farmers operate power tillers even for more than a day. The operator has got to guide/control the forward movement of the machine by actuating hand clutches provided on each handle or sometimes by pushing/pulling the handles towards sides. We attach a differential gear for turning the mini tractor. We attach a compound gear for reducing the speed of mini tractor and increasing the torque which gives more power to the wheel the main clutch is a lever on the handle. The lever are often shifted to on or off position while operating within the field. This machine done many operations by small changes or assembly and disassembling of some tools. Operations are cultivation, seed sowing, row making, leveler, hopper, flour milling, and water pumping.

2.1 COMPONENTS OF MINI TRACTOR

A Mini Tractor/Power Tiller consists of the following main parts:

- Engine
- Transmission Gears
- Clutch
- Brakes
- Chain sprocket
- Differential Gear
- Wheels

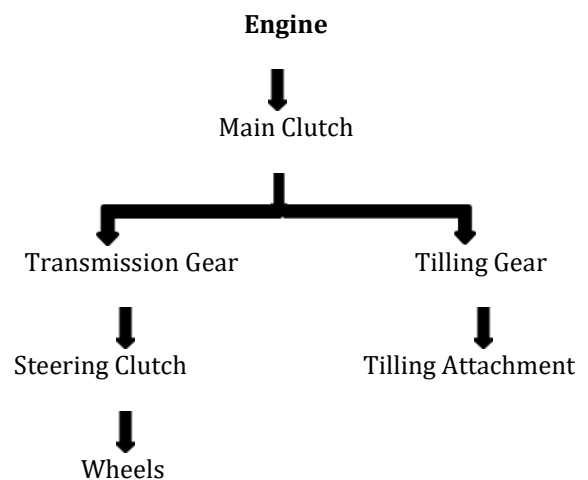
2.2 POWER TRANSMISSION IN A MINI TRACTOR

For operation of mini tractor, the power is obtained from the IC Engine, fitted on the mini tractor. The engine power goes to the most clutch with the assistance of chain sprocket or

chain. Chain sprocket is typically wont to transmit power from the engine to the most clutch.

Mini tractor remains an important mode of power for farming operations, especially in land preparations. The machine saves time and improves the land productivity. Wetland tillage in rice land cultivation is that the main operation that this machine is used.

The flow chart for transmission of power is given below:



3. ATTACHMENTS ON A MINI TRACTOR (POWER TILLER)

Several attachments are made on a mini tractor because this machine provides enormous amount of power at a low cost. The attachments made on a mini tractor and their operations are given below:

1. Cage Wheel



Cage wheels are effective implement for tractors to satisfy the challenges encountered within the wet field. Best suitable for puddling operation.

Features:

- Decreases load on tiller
- Helps to improve traction performance

- Easy to fit
- Cage wheel with float is provided

2. Cultivator:



Cultivation tool is connected between two wheels it is operated by manual force. Cultivating tool is easily assemble and dissemble. This operation is done by the manual force.

Features:

- It is designed for toughest operations.
- Top quality steel shanks are heat treated for long life.
- Rugged all steel construction for durability.
- Ideal for seedbed preparation.

3. Row Maker



The row maker creates planting furrows by simply pulling the tool through worked soil. It is easily assemble and dissemble.

4. Land Leveler



Land Leveler is an important equipment that is used for farming and agricultural with a purpose to level the land.

5. Hopper Tool



Hopper is mounted on chassis front to the engine, for stored seeds. Shank is that the shaft of hopper for slouching seeds.

Features:

- High strength and rigidity.
- Though in construction.
- Depth control adjustment screw.

6. Seed Sower



The sowing operation are often done by semi manual. The operation of seed sowing is to place the seed and seed in rows at required depth and seed to seed spacing, cover the seeds with soil and provide proper compacting over the seed.

Features:

- Seeding sowing distance can be maintained.
- Suitable for sowing directly after paddy harvest without prior seed preparation.
- Saves seeds, petrol and time.
- Saves labor cost.
- Gives higher yield crops.
- Quite one crop seed sowing possible at a time.

7. Sprayer Unit



The sprayer is employed for spraying pesticides and insecticides to avoid pests in following areas:

- 1) Coconuts
- 2) Chico
- 3) Pomegranates
- 4) Grapes
- 5) Guavas
- 6) Bananas
- 7) Papayas
- 8) Mangos

8. Water Pump



- Domestic Pump – To pump water from watering canals, rivers and wells, etc.
- Self-Priming Pump – Self priming pump with tanker are often fitted for cleaning septic tanks, clogged drainage, community wells, etc.

9. Flour Milling



This machinery is attached with the help of pulley. When mini tractor is in standing position then this flour milling can be done.

4. CONCLUSIONS

The product was designed and developed on existing engine operated sweeper welder machine, implementing the 3-wheeler arrangement. The AIM of “Fabrication of multipurpose agricultural Mini Tractor” is provide farmer with multipurpose equipment which implements all the scientific farming specifications and technology to get maximum yield and good quality crops reducing investment and member of labor. The machine is successfully tested into farming field and reduces time 62.5% for ploughing and 66% for seed sowing as compare to the traditional method. Less manpower needed to operate this machine i.e. 1 person to operate. Therefore, the cost of production crops is less. The device is formed such are often easily operated in field. The vehicle power is provided by four stroke petrol engines, and controls are given at handles and foot rest. When it is in standing position flour milling, water pumping, etc, operations can be done with the help of pulley attachment.

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